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The Effects of Using Student-Generated and Expert-Generated Knowledge Maps on Acquisition and Recall

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Abstract

Problem Statement: Knowledge map (K-map) is a means of schematically displaying important verbal information in a text and relations among the pieces of information. In a K-map, information in a text is presented as node-link-node assemblies. There are two main approaches to the use of K-maps. First one is to train students to generate their own K-maps. And the second one is to use expert-generated K-maps.

Purpose: The purpose of the present study is to determine whether expert-generated or student-generated knowledge maps have more positive influences on students' acquisition and recall levels. In light of the findings of the present study it is intended to find out which type of knowledge map is more effective and some suggestions will be made to develop better learning-teaching activities in elementary education.

Methods: The present study, pre- and post-test experimental design with a control group is used. For the study, Experimental Group (Student-generated Knowledge Map) and Control Group (Expert-generated Knowledge Map) were determined with equal possibility. The study group of the present research consists of 29 eight grade students. Two data collection instruments were used to collect data in the study. One of them is "space relations aptitude test" and the other one is 31-item multiple choice "Acquisition Level Test" developed to evaluate the acquisition and recall levels of the students in relation to the text entitled "Maslow's Hierarchy of Needs". In the present study, the text entitled "Maslow's Hierarchy of Needs" was used on which K-maps would be constructed.

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Findings and Results: No significant difference was found between the acquisition and recall scores of the control group students using the expert-generated K-maps and those of the experimental group students using the student-generated K-maps. This shows that using whether the expert-generated K-maps or student-generated K-maps did not lead to significant difference in acquisition and recall levels.

Recommendations: In light of the findings of the present study, it can be argued that use of expert-generated K-maps in learning-teaching process has effects on acquisition and recall levels of students similar to the effects of using student-generated K-maps. Both expert-generated and student-generated K-maps can be used in the learning-teaching process built on constructivist approach.

Keywords: Knowledge map, acquisition level, recall level, student-generated and expert-generated knowledge maps.

The purpose of the present study is to determine whether expert-generated or student-generated knowledge maps have more positive influences on students' acquisition and recall levels. In this way, answer to the question "Does it make any significant difference to use expert-generated or student-generated knowledge maps in students' acquisition and retention levels?" is sought. Knowledge map technique was developed by a group from Texas Christian University (McCagg & Dansereau, 1991). Dansereau et. al, developed k-map as an alternative to the traditional way of presenting a written text (Dees, Dansereau, Peel, Boatler, & Knıght, 1991). Knowledge map is a means of graphical display. By its broadest definition, it is a means of illustrating verbal knowledge (Jones, Pierce, & Hunter, 1989). K-map is the illustration of knowledge to present, use and share it (Çınar, 2002). K-map is a means of schematically displaying important verbal knowledge in a text and relations among the pieces of knowledge. K-map is one of the techniques used to translate a text into two-dimensionally constructed maps to represent the knowledge better (O'Donnell, 1994). In a K-map, knowledge presented in a text, is presented as node-link-node assemblies (Wiegmann, Dansereau, McCagg, Rewey, &Pitre, 1992). In a K-map, basic concepts related to the main idea of a text, sub-concepts related to the main concept and important information (features, definitions, types, samples) concerning all these concepts are presented within geometrical figures of different shapes and sizes which are called "node". Inside the nodes, together with the words, pictures, formulas etc. and other signs can also be placed (Lambiotte &Dansereau, 1992). Another aspect of a K-map is the links showing the relationships among nodes. Links are the arrows drawn among nodes to show the connections among the pieces of knowledge within the nodes. For better indication of the relations among the pieces of knowledge in the nodes, some words or abbreviated labels are written on each link. Abbreviations are written on the link to show the type and direction of the relationship it shows (Rewey, Dansereau, Skaggs, Hall, & Pitre, 1989; McCagg & Dansereau, 1991; Lambiotte & Dansereau, 1992; Wıegmann et al., 1992). In this way, students can easi-

ly and holistically recognize what type of relation exists among the main concept, sub-concepts and other important knowledge at a glance.

Knowledge-map system is a means of visually explaining the relations among the pieces of information through node-link webs. In this system, it was found that K-maps enhance the acquisition and transfer of information (Rewey, et al., 1989). K-maps may facilitate the acquisition of information by students because in K-maps, the summary of information is more easily accessible than an ordinary text. Students learning the information presented in a text from a K-map can have a higher recall of the main ideas than the students learning the same information from a text. In a two-dimensional display, the relationships among the concepts can be comprehended more easily than texts. Knowing the relationships among the ideas is of great importance to store the information better and more effectively in memory (O'Donnel, 1994).

Another informative characteristic of a K-map is that through the linking arrows drawn between nodes, it makes easier for students to comprehend the relationships among the concepts. Sequential complexity (relating the sentence construction rules) can be made more manageable by means of labeling the linking arrows drawn among the concepts, terms and samples in nodes. Such a display of information in K-maps reduces the complexity existing in a text (Lambiotte, & Dansereau, 1992).

There are two main approaches to the use of K-maps. First one is to train students to generate their own K-maps. And the second one is to use expert-generated K-maps. Hence, the research on K-maps is classified into two groups as student-generated and teacher-generated.

Student-generated K-maps

Students can be taught how to generate their own K-maps as a study support. Based on the steps constructed by Amer (1994) through adaptation of Pauk' study (1989), the steps to be followed in the generation of a K-map can be given as follows:

1- The main and most comprehensive concept should be found and it should be written at the top of the page where the K-map will be constructed and it should be enclosed in a node.

2- The other less comprehensive sub-concepts representing the other important information should be found and written within nodes.

3- Sub-concepts of the text should be written and sequenced under the main concept.

4- Important auxiliary information related to the main and sub-concepts (samples, features, types etc.) should be found and should be written briefly under or opposite the related main or sub-concepts. It should be enclosed within nodes.

5- The relationships among the nodes enclosing the opinions related to the main concept, sub-concepts and important auxiliary information should be indicated through arrows drawn among the nodes. Abbreviations should be written on the arrows to show what type of relation they represent.

In general, student-generated K-maps are less formal than expert-generated K-maps (that does not mean that they are less organized). Student-generated K-maps show how the individual interpret the information unit (McCagg & Dansereau, 1991). The findings of some research show that student-generated K-maps have positive influences on students' comprehension and recall levels of a text (Berkowitz, 1986; McCagg & Dansereau, 1991; Amer, 1994). According to McKeachie (1984), though working with K-maps enhances students' achievement, teaching students how to generate K-maps is a high-cost task (O'Donnel, 1994). However, students-generated maps enable students to comprehend and recall the information more easily when compared to expert-generated maps (McCagg & Dansereau, 1991). The reason why student-generated ones are more effective is that the students participate more actively in the process while constructing the map (Hall, Dansereau & Blair, 1990). Yet, while student-generated maps seem to be better for various activities, they are not without problems. Some authors argue that map-construction is a technique on which expertise is difficult to acquire and it may take too much time for low-ability students to grasp it (McCagg & Dansereau, 1991). In order for k-map to be effective, it needs to be constructed in such a way that the reader can compare the relations among the pieces of knowledge; in particular, in such a way that he can directly compare them (Hall, Dansereau & Skaggs, 1992).

Expert-generated Maps

Expert-generated maps are developed by subject area experts. Expert-generated maps, by using the characteristic properties of Gestalt Theory and orderly constructed relationships, are the maps organizing information and presenting it in a reasonable manner. Research looking at the effects of expert-generated maps points out that they have a potential to enhance comprehension by serving the role of an advance organizer and aiding material. One of the positive sides of expert-generated K-maps is that they can contribute to learning by presenting macro structures of the subjects difficult to understand for students and logical and reciprocal connections between important and less important constructs (McCagg & Dansereau, 1991).

Despite their some observed positive effects, there are two factors to be considered in the use of expert-generated K-maps: one of them is the fact that students reading expert-generated K-maps tend to focus on nodes more than the information relating learning process. The other one is while using expert-generated K-maps, students miss the chance of generating their own K-maps (McCagg & Dansereau, 1991). Hall (1988) and Rewey (1989) state that expert-generated K-maps have some positive effects on acquisition and recall of information (McCagg & Dansereau, 1991).

Expert-generated maps are developed by subject area experts or teachers. Expert-generated K-maps are constructed to maximize communicative potential (McCagg & Dansereau, 1991). Existing research indicates that the use of expert-generated K-

maps as aiding materials in class can enhance the acquisition and recall of information (Rewey et al., 1989; Lambiotte & Dansereau, 1992; Patterson, Dansereau & Newbern, 1992; Shaw, 2010).

The purpose of the present study is to determine whether expert-generated or student-generated knowledge maps have more positive influences on students' acquisition and recall levels. For this purpose, the present study investigated the effects of the K-maps generated by students based on an informative K-maps and ready-made expert-generated K-maps on acquisition and recall levels. With the above-mentioned properties, K-maps are suitable learning tools to be employed within constructivist approach adopted by elementary school programs. In light of the findings of the present study, it is intended to determine which of the K-maps is more effective and some suggestions will be made to be used in learning-teaching activities. For this purpose, the present study seeks answers to the following questions:

1. Is there a significant difference between the acquisition level of the experimental group students using student-generated K-maps (their own K-maps) and the acquisition level of the control group students using expert-generated K-maps (ready-made K-maps)?
2. Is there a significant difference between the recall level of the students using student-generated K-maps and the recall level of the students using expert-generated K-maps?

Method

Research Design

In the present study, pre- and post-test experimental design with a control group is used.

Participants

For the study, Experimental Group (Student-generated Knowledge Map) and Control Group (Expert-generated Knowledge Map) were determined with equal possibility. The study group of the present research consists of 29 eight grade students selected from two different classrooms in Türdü 100. Yıl Elementary School located in Muğla city in 2011-2012 school year. And 13 of the students were assigned to the experimental group and 16 of them were assigned to the control group. Average age of the students is about 15.

Study Materials

In order to construct K-maps in the study, a text entitled "Maslow's Hierarchy of Needs" (Şahin, 1983, p.3-7) was selected. Richness of the link structures of K-maps leads to the use of the technique in various fields such as statistics, biology and psychology (McCagg & Dansereau, 1991). The above-mentioned text was converted into K-maps by the authors. The control group used this expert-generated K-map. The experimental group students, on the other hand, generated their own K-map from the same text and used it.

Testing Materials

In order to test and equalize the groups with regards to their differences before the experiment two tests were used. These are Space relations aptitude test and "pre-test" measuring existing knowledge about Maslow's Hierarchy of Needs.

Individual Difference Testing Material

Space relations aptitude test. The extent to which the participants benefit from K-maps varies depending on their spatial aptitudes (Wiegman et al., 1992). Hence, Visual-spatial aptitude levels of the students of both experimental and control groups were tested via "space relations" test before the experiment. For this purpose, Different Aptitude Battery developed by Bennet, Seashore, & Wesman in 1947 was used to evaluate some basic aptitudes of the students. With the expectation that aptitude of internalizing the K-map, a type of visual-spatial display, is affected by space relations aptitude, 40-item "space relations" test which is a sub-test of Different Aptitude Battery and was translated to Turkish by Remzi Öncül was administered. "Space relations aptitude test measures visual perception strength and designing ability for newly emerging images as a result of changes taking place in different objects" (Özgüven, 2004, p.248). Vural (1977) conducted the reliability and validity works of space relations test among 9th graders. The reliability coefficient of the test calculated with KR–21 was found to be 0.94 for the students from middle socio-economic level. The correlation of the test with general academic average point was found to be 0.29.

Scoring. The mean score of the experimental group from Space Relations Test was found to be M=16,21 and that of the control group was found to be M=17.41. Whether there are significant differences among the students' scores from space relations aptitude test was analyzed through Tukey HSD test. According to the results of this test, no significant differences were observed between the space relations aptitude scores of the experimental group and control group. According to this finding, it can be argued that experimental group and control group have similar space relations aptitudes ($p= 0.941$ $p<0.05$).

Pre-Test. A test consisting of 31 multiple-choice items was used in order to measure the students' acquisition and recall levels of the new knowledge. First, for the piloting purpose, a test consisting of 38 multiple-choice questions based on the knowledge presented in the map was administered to a group of 57 people who would not be involved in the study and were trained about the "Maslow's Hierarchy of Needs". After item analysis was conducted on the results, the test took its final form with 31 items. The reliability coefficient of the test was found to be 0.95.

Scoring. In the study, whether there are differences between the control group and experimental group with regards to their prior knowledge about what will be presented in text was tested. For this purpose, independent-samples t test was conducted on the scores obtained from the pre-test. Pre-test mean score for the experimental group was found to be M=16.846 and its was found to be M=17.250 for the control group. According to the findings of this analysis, no significant difference was observed between the pre-test scores of the both groups. Hence, it can be told

that the groups had the similar knowledge about what would be presented in the K-maps before the experiment (t:-0.273 $p<0.05$).

Procedure

The study started with the measurement of the students' prior knowledge level about the topic of the text to be used and the groups were then equalized. One of the groups was randomly assigned to control and the other one to experimental. The control group was instructed about K-maps (introduction to them and how to use them) for two class hours before the study. The experimental group was given applied training about what a K-map is and how it is constructed by the researcher for two class hours. The experimental group was provided with the text "Maslow's Hierarchy of Needs" and they were asked to generate their K-map within a class hour (40 minutes).The control group was provided with the expert-generated K-map and they were asked to study it for a class hour (40 minutes). Following the completion of the application, "Acquisition Level Test" was administered to the both groups as a post-test to determine their acquisition level of the text. One week after the study, "Acquisition Level Test" was administered to the groups once more to evaluate their recall levels.

Data Analysis

While analyzing the data of the present study, SPSS program package was employed. For the comparison of two groups, independent t-test was used and for the comparison of more than two groups (determination of matches, space-relations test results) ANOVA variance analysis was employed and Tukey HSD was used to compare the groups according to the ANOVA results.

Results

The Findings Regarding Acquisition Level

The first research problem of the study was stated as follows: "Is there a significant difference between the acquisition level of the experimental group students using student-generated K-maps (their own K-maps) and the acquisition level of the control group students using expert-generated K-maps (ready-made K-maps)?". To find an answer to this question, t-test was conducted to determine whether there is a significant difference between the posttest mean scores of the control group and experimental group.

Table 1

Descriptive Statistics and T-Test Results Concerning the Acquisition Levels of The Experimental and Control Groups

Map group	*N*	*M*	*SD*	*df*	*t*	*p*
Student-generated K-map (Experimental Group)	13	22.307	4.697	27	.812	.424
Expert-generated K-map (Control group)	16	20.875	4.745			

P<.05

As can be seen in Table I, there is no significant difference between the acquisition scores of the experimental group students using the student-generated K-maps and those of the control group students using the expert-generated K-maps (t= .812, p<.05). Hence, it can be argued that whether students use the K-maps they generated or expert-generated K-maps does not lead to significant difference in their acquisition levels. Both types of K-maps have similar effects on students' acquisition levels.

The Findings Regarding Recall Level

The second research problem of the study was stated as follows: "Is there a significant difference between the recall level of the students using student-generated K-maps and the recall level of the students using expert-generated K-maps?" To find an answer to this question, independent t-test was conducted to determine whether the difference between the mean recall scores of the experimental group and control group.

Table 2

The Descriptive Statistics and T-Test Results Concerning the Recall Levels ofThe Experimentaland Control Groups

Map group	*N*	*M*	*SD*	*df*	*t*	*p*
Student-generated K-map (Experimental Group)	13	21.692	6.823	27	.259	.798
Expert-generated K-map (Control group)	16	21.125	4.978			

P<.05

As can be seen in Table II, there is no significant difference between the recall scores of the experimental group students using the student-generated K-maps and those of the control group students using the expert-generated K-maps (t= .259, p<.05). Hence, it can be argued that whether students use the K-maps they generated or expert-generated K-maps does not lead to significant difference in their recall levels. Both types of K-maps have similar effects on students' recall levels.

Discussion and Conclusion

In the present study, both types of K-maps had similar effects on the students' acquisition level. This finding can be interpreted as follows: The effect of K-maps on the realization of learning in mental processes does not vary depending on their being either student-generated or expert-generated. Hall et al., (1990) also found that whether students use student-generated or expert generated K-maps does not lead to significant difference in students' acquisition and recall levels. This finding concurs with our research findings. McCagg & Dansereau (1991) report that using K-map technique can be difficult and time-consuming for students who are not accustomed to it. Through the interviews and unsystematic observations made during the study, it was seen that the use of this technique by the students was restricted to this study and because of this low frequency of use, similar results may have been obtained by both of the groups. The fact that the students focused on designing K-maps according to rules may have deterred them from concentrating on meaning. The fact that no significant difference was found between the students generating not much professional K-maps and the students working on the expert-generated K-maps can be regarded as somehow a positive outcome for the experimental group students working with their own K-maps.

In the present study, both types of K-maps had similar effects on the students' recall level. This finding can be interpreted as follows: K-maps are tools used to organize information. Organization of the information presented in the text in the form of K-maps for both groups contributed to the students' understanding of the information. It can also be argued that K-maps facilitate the coding of the information; hence, conducive to its storage in the long-term memory. Use of similar processes in information processing may have led to similar recall levels. Organization of information not only facilitates the coding of the information to be stored in the long-term memory but also enhances its retention and recall (Senemoğlu, 2009, p. 308). The fact that no significant difference was found between the students generating not much professional K-maps and the students working on the expert-generated K-maps in terms of their recall levels can be regarded as somehow a positive outcome for the experimental group students working with their own K-maps.

According to the results of the present study, there is no significant difference between both acquisition and recall levels of the experimental and control groups. Hence, it does not make much difference whether students use expert-generated K-maps or student-generated K-maps in terms of their acquisition and recall. This finding can be interpreted as follows: As students generating their own K-maps use in-

formation processing processes effectively and students using expert-generated K-maps take advantage of the well-constructed and organized structures of these maps, they may have similar gains from K-maps. The existing research shows that expert-generated K-maps have positive impacts on acquisition and recall when used as supporting materials in lessons (Rewey et al., 1989; McCagg & Dansereau, 1991; Lambiotte & Dansereau, 1992; Patterson et al., 1992; Shaw, 2010). Some research findings (Berkowitz, 1986; McCagg & Dansereau, 1991; Amer, 1994) on the other hand indicate that student-generated K-maps have positive influences on text comprehension and recall levels.

As a result, using expert generated K-maps enhances learning by facilitating the acquisition, use and organization of information during learning. In addition to this, students should be trained to generate their own K-maps based on the cognitive strategies they are expected to adopt during reading comprehension process. In a learning-teaching process based on constructivist approach, both student-generated and expert-generated K-maps can be used. Students should be educated about how to generate their own K-maps. During such an education, feedback should be given by presenting numerous examples. Teachers should be encouraged to use K-map based teaching activities as supporting materials. While the content is arranged in resource text books, expert-generated K-maps should be included. Future research can be longitudinal to investigate the long-term effects of using K-maps. Moreover, it may look the effects of K-maps on acquisition and recall levels of students with different characteristics. The present study was conducted by giving k-map instruction to experimental group students through direct teaching method. Further research may look at the effects of new methods (e.g. cooperative learning) on outcomes. Moreover, the present study did not investigate the competency level of student-generated K-maps. Future research may classify student-generated K-maps based on competency level and make comparisons. How to make use of expert-generated K-maps in class can be another research topic of future studies. Such maps should be used as advance organizers? Should they be used by student pairs as any form of social constructivism? Or should they be used instead of a text? Answers to such questions can be found through new research.

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Uzman ve Öğrenci Kaynaklı Bilgi Haritalarının Kullanımının Öğrenme ve Hatırlama Düzeyine Etkisi

Atıf:

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Özet

Problem Durumu: Bilgi haritası (bh) bir grafiksel gösterim türüdür. Grafiksel gösterimler, en genel anlamıyla, sözel bilgilerin resimlendirilmesidir. Bilgi haritası bir metindeki önemli sözel bilgilerin ve bu bilgiler arasındaki ilişkilerin şematik olarak gösterilme biçimidir. Bilgi haritası, bir metindeki bilgiyi göstermek için metni iki boyutlu olarak yapılandırılmış haritalara dönüştürme tekniklerinden biridir. Bilgi haritasında metindeki bilgiler çerçeve-bağ-çerçeve kümeleri şeklinde gösterilmiştir. Bilgi haritasında, metnin ana düşüncesi ile ilgili temel kavram, temel kavramla ilgili alt kavramlar, bunlarla ilgili önemli bilgileri(özellikler, tanımlar, türler, örnekler) özetleyen bilgiler, "çerçeve" adı verilen değişik geometrik biçim ve boyuttaki şekiller içine yerleştirilir. Bu çerçevelerinin içine sözcüklerle birlikte resim, formül vb. diğer işaret ve rakamlar da yerleştirilebilir. Bilgi haritalarının diğer boyutu ise, çerçeveler arasındaki ilişkiyi gösteren bağlardır. Bağ, çerçeveler içinde yer alan bilgiler arasındaki ilişkiyi gösteren ve çerçeveler arasında çizilen oklardır. Her bağ, çerçevelerdeki bilgiler arasındaki ilişkinin daha iyi belirlenmesini sağlamak için kelimelerle ya da kısaltılmış sözel bir etiket ile gösterilir. Oklar ne tür ve hangi yönde bir ilişkiyi gösteriyorsa, ilişki bu okların üzerine kısaltılarak yazılır. Bu sayede öğrenciler, çerçeve içindeki ana kavram, alt kavramlar ve önemli diğer bilgiler arasında nasıl bir ilişki olduğunu bir bakışta ve bütüncül olarak kolayca görebilirler.

Bilgi haritası sistemi görsel bir biçimde hücre-bağ ağı yoluyla bilgiler arasındaki ilişkiyi açıklamaktadır. Bu sistemle üretilen bilgi haritalarının bilginin kazanımını ve aktarımını artırdığı saptanmıştır. Bilgi haritaları öğrencilerin yeni bir bilgiyi öğrenmelerini kolaylaştırabilir. Çünkü bir bilgi haritasında metnin özeti, düz bir metinden daha kolay elde edilebilir. Bir metindeki bilgileri, bilgi haritasından öğrenen öğrenciler, metinden öğrenenlere göre ana düşünceleri daha çok hatırlarlar. Bilgi haritalarının kullanımında iki genel yaklaşım göze çarpmaktadır. İlki, öğrencileri kendi haritalarını yaratmaları için eğitmektir. İkincisi, derste kullanmak üzere ders planlarken veya çalışma desteği sağlamak için uzmanlar tarafından hazırlanan bilgi haritaları kullanmaktır. Öğrencilere çalışma desteği olarak kullanmak üzere kendi bilgi haritalarını oluşturmaları öğretilebilir. Uzman kaynaklı haritalar, konu alan uzmanları tarafından üretilirler. Uzman kaynaklı haritalar, Gestalt Kuramının karakteristik özelliklerini ve düzenli bir şekilde yapılandırılmış ilişkileri kullanarak; bilgileri organize eden ve mantıklı bir tarzda sunan haritalardır. Uzman kaynaklı haritaların etkilerini araştıran çalışmalar, bu haritaların ön organize edici ve derslere yardımcı bir rol oynayarak okumaları destekleyici bir potansiyeli

olduğundan söz etmektedirler. Genel olarak öğrenci kaynaklı haritalar, uzman kaynaklı haritalardan daha az biçimseldir(fakat bu daha az örgütlü anlamına gelmez). Öğrenci kaynaklı haritalar, bireyin bir bilgi bütününü nasıl yorumladığını gösterir.

Araştırmanın Amacı: Bu araştırma öğrenci ve uzman kaynaklı bilgi haritalarından hangisinin öğrenme ve hatırlama düzeylerine daha çok etkili olduğunu ölçme amacı taşımaktadır. Bu amaçla araştırmada, öğrencilere verilen bilgilendirici bir metni bilgi haritasına dönüştürme ile hazır verilen bilgi haritalarının öğrencilerin öğrenme ve hatırlama düzeylerine katkısı incelenmektedir. Bilgi haritaları yukarıda açıklanan özellilikleri ile ilköğretim programlarının dayandığı yapılandırmacı öğrenme yaklaşımında kullanılmaya uygun öğrenme araçlarıdır. Bu araştırma sonuçlarına bakılarak, hangi tür bilgi haritalarının daha etkili olduğu belirlenecek ve İlköğretim programlarının öğrenme-öğretme etkinliklerinde kullanılmak üzere önerilerde bulunulacaktır.

Araştırmanın Yöntemi: Bu araştırmada, denk kontrol gruplu öntest-sontest deneysel yöntem kullanılmıştır. Araştırma için, G1 Deney Grubu (Öğrenci Kaynaklı Bilgi Haritası) ve G2 Kontrol Grubu (Uzman Kaynaklı Bilgi Haritası) eş olasılıkla belirlenmiştir. Araştırmanın çalışma grubunu, 2011-2012 Eğitim-Öğretim yılında, Muğla ili Merkez ilçesinde Türdü 100. Yıl İlköğretim Okulu sekizinci sınıflar arasından seçilen iki şubeden deney grubunda 13, kontrol grubunda 16 öğrenci oluşturmaktadır. Araştırmada, veri toplama amacıyla iki ölçme aracı kullanılmıştır. Bunlardan biri, öğrencilerin şekil-zemin ilişkilerini anlama düzeylerini belirlemek, amacıyla kullanılan "Şekil-zemin testi", diğeri ise öğrencilerin "Maslow'un ihtiyaçlar hiyerarşisi" başlıklı metne ilişkin öğrenme ve hatırlama düzeylerini belirlemek amacıyla geliştirilen 31 maddelik çoktan seçmeli "Öğrenme Düzeyi Testi" dir. Araştırmada bilgi haritası oluşturulacak metin olarak "Maslowun İhtiyaçlar Hiyerarşisi" başlıklı metin seçilmiştir. Kontrol grubu öğrencilerine bu metnin bh araştırmacılar tarafından oluşturularak hazır verilmiştir. Deney grubu öğrencileri ise aynı metnin bilgi haritasını kendileri oluşturmuş ve onu kullanmışlardır.

Araştırmanın Bulguları: Öğrenci Kaynaklı Bilgi Haritalarını kullanan Deney grubu ile uzman kaynaklı bh larını kullanan kontrol grubunun öğrenme düzeyi puanları arasında anlamlı bir fark bulunamamıştır. Bu sonuca göre, öğrenme–öğretme sürecinde öğrencilerin uzman kaynaklı bh ya da kendi yaptıkları bh çalışma desteği olarak kullanmaları onların öğrenme düzeyi üzerinde anlamlı bir farklılık meydana getirmemiştir. Öğrenci kaynaklı bh kullanan deney grubu ile uzman kaynaklı bh larını kullanan kontrol grubunun hatırlama düzeyi puanları arasında da anlamlı bir fark bulunamamıştır. Bu sonuca göre, öğrenme–öğretme sürecinde öğrencilerin hazır bh ya da kendi yaptıkları bh kullanmaları onların hatırlama düzeyinde anlamlı bir farklılık meydana getirmemiştir.

Araştırmanın Sonuçları ve Önerileri: Araştırma sonuçlarına göre, deney ve kontrol gruplarının hem öğrenme hem de hatırlama düzeyleri arasında istatistiksel olarak anlamlı bir farklılık bulunamamıştır. Bu sonuçlara göre öğrenciler öğrenme ve öğretme sürecinde ister uzman kaynaklı bh ister öğrenci kaynaklı bh kullansınlar

öğrenme ve hatırlama düzeyleri üzerinde benzer etkiler yarattığı söylenebilir. Yapılandırmacı anlayış temeline dayalı olan öğrenme-öğretme sürecinde gerek öğrenci kaynaklı gerekse öğretmen kaynaklı bh kullanılabilir. Öğrencilere kendi bh oluşturma eğitim verilmelidir. Bu eğitimlerde çok sayıda örnekler gösterilerek dönütler sunulmalıdır. Öğretmenler bh öğretim etkinliklerine yardımcı bir araç olarak kullanmaları konusunda teşvik edilmelidir.

Anahtar Sözcükler: Bilgi haritası, öğrenme düzeyi, hatırlama düzeyi, öğrenci ve uzman kaynaklı bilgi haritası